NASA TECH BRIEF

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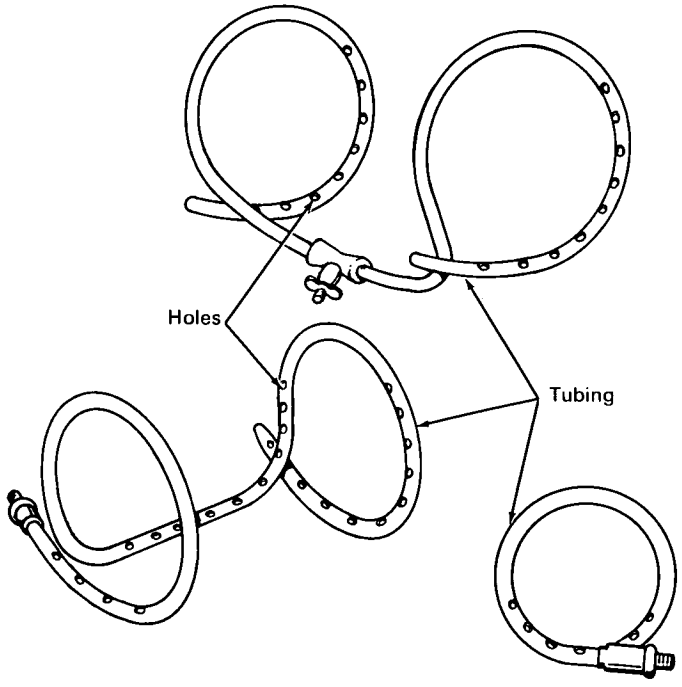
Inert Gas Spraying Device Aids in Repair of Hazardous Systems



The problem: When it is necessary to make emergency or quick mechanical repairs to piping, flanges, valves, and safety devices of a cryogenic fluid system, the system must be emptied and the Dewar and associated lines warmed and neutralized before work may proceed. This is done to prevent contaminants such as oxygen and dirt from mixing with any hazardous fluid being transferred in the system.

The solution: Develop a method by which mechanical repairs may be safely made to the system without emptying it.

How it's done: Surround the opening in the cryogenic system with a bath or envelope of inert gas while repairs are being made. This inert gas prevents contaminants from mixing with the fluid in the system. To apply the envelope or bath to the opening to be repaired, an apparatus made of a copper tubing which has been drilled with tiny holes is used. These holes are drilled at an angle that will allow the gas to be sprayed in a desired pattern. One or more pieces of copper tubing may be used, depending on the area to be covered.

(continued overleaf)

Notes:

1. Repair jobs can be completed in a period of a few minutes to approximately four hours by use of this innovation. A conservative estimate of time necessary to complete the same job by the old method is 40 hours. The amount of inert gas required is negligible compared to the 40,000 to 50,000 cubic feet needed for warming-up and neutralizing a large Dewar by the old method.
2. This innovation can be used only for mechanical type repairs (threads, nuts and bolts, and such) and not for welding, soldering, or other heating operations. Obviously, even with an inert gas envelope surrounding the system there are traces of oxygen present and possibly mixed with the hazardous fluid. Therefore, any repairs to the system must be the type that produces no source of ignition (heating, generation of sparks, and the like) which could cause these trace amounts of oxygen to react with the hazardous fluid.
3. This innovation can be applied to any natural or bottled gas system which cannot be neutralized because of extended time or cost considerations. With modifications, it could be applied to gasoline transports.
4. Inquiries concerning this innovation may be directed to:

   Technology Utilization Officer
   Lewis Research Center
   21000 Brookpark Road
   Cleveland, Ohio, 44135
   Reference: B65-10115

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: Stephen Teleha
(Lewis 8B)